

CLAIMS:

1. A method to reduce the effects of joint disease in a mammal, the method comprising:
 - 5 selecting a mammal suspected of having a joint afflicted with a joint disease;
 - administering one or more viral particles to the joint by arthrocentesis; and
 - detecting a reduction in the effects of the joint disease on the treated joint;
 - wherein the viral particles comprise a nucleic acid sequence encoding an equine interleukin-1 receptor antagonist protein.
- 10 2. The method of claim 1, wherein the mammal is a horse.
3. The method of claim 1, wherein the mammal is a rabbit, mouse, dog, cow, donkey, or mule.
4. The method of claim 1, wherein the mammal is a human.
5. The method of claim 1, wherein at least about 10^9 viral particles are
- 15 administered to the joint.
6. The method of claim 1, wherein the viral particles are adenoviral particles.
7. A method to increase the influx of white blood cells into the joint of a mammal, the method comprising:
 - selecting a mammal comprising a joint for treatment; and
 - 20 administering one or more viral particles to the joint by arthrocentesis;
 - wherein:
 - the viral particles comprise a nucleic acid sequence encoding an equine interleukin-1 receptor antagonist protein; and
 - the rate of influx of white blood cells into the administered joint is
 - 25 higher than the influx of white blood cells in an untreated joint.
8. The method of claim 7, wherein the mammal is a horse.
9. The method of claim 7, wherein the mammal is a rabbit, mouse, dog, cow, donkey, or mule.
10. The method of claim 7, wherein the mammal is a human.
- 30 11. The method of claim 7, wherein at least about 10^9 viral particles are administered to the joint.
12. The method of claim 7, wherein the viral particles are adenoviral particles.

13. A method to increase the percentage of neutrophils in the joint of a mammal,
the method comprising:
selecting a mammal comprising a joint for treatment; and
administering one or more viral particles to the joint by arthrocentesis;
5 wherein:
the viral particles comprise a nucleic acid sequence encoding an equine
interleukin-1 receptor antagonist protein; and
the percentage of neutrophils in the administered joint is higher than
the percentage of neutrophils in an untreated joint.
- 10 14. The method of claim 7, wherein the mammal is a horse.
15. The method of claim 7, wherein the mammal is a rabbit, mouse, dog, cow,
donkey, or mule.
16. The method of claim 7, wherein the mammal is a human.
17. The method of claim 7, wherein at least about 10^9 viral particles are
15 administered to the joint.
18. The method of claim 7, wherein the viral particles are adenoviral particles.
19. A method to decrease the percentage of mononuclear cells in the joint of a
mammal, the method comprising:
selecting a mammal comprising a joint for treatment; and
20 administering one or more viral particles to the joint by arthrocentesis;
wherein:
the viral particles comprise a nucleic acid sequence encoding an equine
interleukin-1 receptor antagonist protein; and
the percentage of mononuclear cells in the administered joint is lower
25 than the percentage of mononuclear cells in an untreated joint.
20. The method of claim 19, wherein the mammal is a horse.
21. The method of claim 19, wherein the mammal is a rabbit, mouse, dog, cow,
donkey, or mule.
22. The method of claim 19, wherein the mammal is a human.
30 23. The method of claim 19, wherein at least about 10^9 viral particles are
administered to the joint.
24. The method of claim 19, wherein the viral particles are adenoviral particles.

25. A method to produce interleukin-1 receptor antagonist protein *in vivo*, the method comprising:
selecting a mammal comprising a joint for treatment; and
administering one or more viral particles to the joint by arthrocentesis;
5 wherein:
the viral particles comprise a nucleic acid sequence encoding an equine interleukin-1 receptor antagonist protein; and
the concentration of interleukin-1 receptor antagonist protein in the administered joint is higher than the concentration of
10 interleukin-1 receptor antagonist protein in an unadministered joint.

26. The method of claim 25, wherein the mammal is a horse.

27. The method of claim 25, wherein the mammal is a rabbit, mouse, dog, cow, donkey, or mule.

15 28. The method of claim 25, wherein the mammal is a human.

29. The method of claim 25, wherein at least about 10^9 viral particles are administered to the joint.

30. The method of claim 25, wherein the viral particles are adenoviral particles.

31. A method to delay the onset of joint disease in a mammal, the method
20 comprising:
selecting a mammal comprising a joint for treatment; and
administering one or more viral particles to the joint by arthrocentesis;
wherein the viral particles comprise a nucleic acid sequence encoding
an equine interleukin-1 receptor antagonist protein.

25 32. The method of claim 31, wherein the mammal is a horse.

33. The method of claim 31, wherein the mammal is a rabbit, mouse, dog, cow, donkey, or mule.

34. The method of claim 31, wherein the mammal is a human.

35. The method of claim 31, wherein at least about 10^9 viral particles are
30 administered to the joint.

36. The method of claim 31, wherein the viral particles are adenoviral particles.